UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/695,139	10/28/2003	Kattamuri Ekanadham	YOR920030559US1	6455

			EXAMINER
7590	09/26/2006		INGBERG, TODD D

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ART UNIT	PAPER NUMBER
2193	

DATE MAILED: 09/26/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>28 October 2003</u>.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1-15</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>1-15</u> is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on <u>28 October 2003</u> is/are: a)☐ accepted or b)☒ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date <u>10/28/2003</u>.

4)☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: _____.

DETAILED ACTION

Claims 1 – 15 have been examined.

Information Disclosure Statement

1.   The IDS filed October 28,2003 has been considered.

Drawings

2.   The drawings filed October 28,2003 are objected to as being informal. The following

summarizes the problems.

Description of Problem	Figure Number
Font too small	1
Characters missing in title	3, 4, 5
Shading too dark	2, 4, 5

Claim Rejections - 35 USC § 101

3.   35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or
> any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and
> requirements of this title.

Claims 1 – 15 are rejected under 35 U.S.C. 101 because the claimed invention is

directed to non-statutory subject matter. The current focus of the Patent Office in regard to

statutory inventions under 35 U.S.C. § 101 for method claims and claims that recite a judicial

exception (software) is that the claimed invention recite a practical application. Practical

application can be provided by a physical transformation or a useful, concrete and tangible

result. No physical transformation is recited and additionally, the final result of the claim is

program tracing which is not a tangible result because the result of the tracing is not clearly

claimed to be on a computer readable medium. The following link on the World Wide Web

is for the United States Patent And Trademark Office (USPTO) policy on 35 U.S.C. §101.

<http://www.uspto.gov/web/offices/pac/dapp/opla/preognotice/guidelines101_20051026.pdf>

Claim Rejections - 35 USC § 102

4.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the

basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5.   Claims 1 – 15 are rejected under 35 U.S.C. 102(b) as being anticipated by David F.

Bacon, Compiler Transformations for High-Performance Computing, 1994.

Claim 1
Bacon anticipates a method of creating a compressed trace for a program (program prior to optimization), said method comprising: selecting a sequence of events for said program (page 402 ID paths); obtaining a sequence of values for each of said events page 402, control flow graph), which values were obtained by executing said program; compressing each said sequence of values to generate a compressed sequence of values for each event (402, control flow graph – optimization), wherein the collection of compressed sequences of values of events generates a compressed trace (Result in optimization – goal of Bacon - page 346); and ordering said values of said compressed trace to generate an uncompressed trace of said program (page 350 – Procedure).

Claim 2
A method as recited in claim 1, wherein said values of said compressed trace are ordered in accordance with information in selected events. Page 402 Traces above 8

Claim 3
A method as recited in claim 1, wherein said sequence of events for said program is selected by dividing said program into blocks of instructions and by associating an event with selected instructions in a block. Page 374 above 6.4.3

Claim 4
A method as recited in claim 3, wherein said program is divided into said blocks according to the occurrence of a branch instruction, where each block has only one branch instruction which is the last instruction in each said block. Page 374 above 6.4.3

Claim 5
A method as recited in claim 1, wherein each said sequence of values for each said event is compressed based upon recognized patterns in each said sequence. Page 401.

Claim 6
A method as recited in claim 5, wherein said recognized patterns comprise at least one of the following patterns: strided patterns (Page 362) and repeat patterns.

Claim 7
A method as recited in claim 1, wherein said selected events are branch instructions and wherein values for latter said selected events are branch targets taken by said branch instructions. Page 406

Claim 8
A method as recited in claim 2, wherein said information comprises target addresses and wherein said selected events comprise branch instructions. Page 379

Claim 9
A method as recited in claim 1, further comprising the step of:
using said compressed sequence of values for an event corresponding to a load instruction to pre-fetch values during the execution of a program. Page 402, speculative instruction scheduling

Claim 10
A method as recited in claim 1, further comprising the step of:
using said compressed sequence of values for an event corresponding to a branch instruction to perform branch prediction during the execution of a program. Pages 402 and 406.

Claim 11
A method as recited in claim 1, further comprising: dividing said compressed trace into segments, wherein said sequence of compressed values in a segment corresponds to a contiguous sequence of values in said uncompressed trace. Page 354, Dependencies Analysis.
Interpretation
From a behavior view the functionality does not change (deterministic). The path through the code is optimized.

Claim 12
A method as recited in claim 11, wherein a segment is terminated at the end of a block such that the size of the segment is between two predetermined values.
Interpretation

The beginning and end commonly known as the segment and offset. Inherent in a basic block.

Claim 13

A program storage device readable by a digital processing apparatus and having a program of instructions which are tangibly embodied on the storage device and which are executable by the processing apparatus to perform a method of creating a compressed trace for a program, said method comprising:
selecting a sequence of events for said program; obtaining a sequence of values for each of said events, which values were obtained by executing said program; compressing each said sequence of values to generate a compressed sequence of values for each event, wherein the collection of compressed sequences of values of all events generates a compressed trace; and ordering said values of said compressed trace to generate an uncompressed trace of said program.
As per the rejection for claim 1.

Claim 14

A program storage device readable by a digital processing apparatus and having a program of instructions which are tangibly embodied on the storage device and which are executable by the processing apparatus, wherein said program modifies a user program to perform a method of creating a compressed trace for a program, said method comprising:
selecting a sequence of events for said program; obtaining a sequence of values, for each of said events, which values were obtained by executing said program; compressing each said sequence of values to generate a compressed sequence of values for each event, wherein the collection of compressed sequences of values of all events generates a compressed trace; and ordering said values of said compressed trace to generate an uncompressed trace of said program. As per the rejection for claim 1.

Claim 15

An apparatus for creating a compressed trace of a program, said apparatus comprising:
means for selecting a sequence of events for said program; means for obtaining a sequence of values for each of said events, which values were obtained by executing said program;
means for compressing each said sequence of values to generate a compressed sequence of values for each event, wherein the collection of compressed sequences of values of all events generates a compressed trace; and means for ordering said values of said compressed trace to generate an uncompressed trace of said program. As per the rejection for claim 1.

Examiner's Comments

6.   Actual invention in the 9 page Specification has gone unclaimed. Claimed invention fails

to mention cache. Claims read on basic profiling and optimization. The late 1980's and early

1990's implemented the use of run time profilers and then used the heuristics during
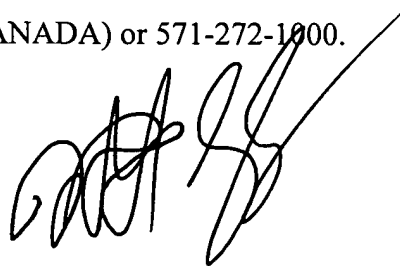
recompilation to optimize the program. This old techniques from the 1980's of a capturing

heuristics and then recompiling could read on the current claims. The claims are not limited to

runtime performance of both profiling and optimizing.

Correspondence Information

Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Todd Ingberg whose telephone number is (571) 272-3723. The

examiner can normally be reached on during the work week..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Kakali Chaki can be reached on (571) 272-3719. The fax phone number for the

organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent

Application Information Retrieval (PAIR) system. Status information for published applications

may be obtained from either Private PAIR or Public PAIR. Status information for unpublished

applications is available through Private PAIR only. For more information about the PAIR

system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR

system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would

like assistance from a USPTO Customer Service Representative or access to the automated

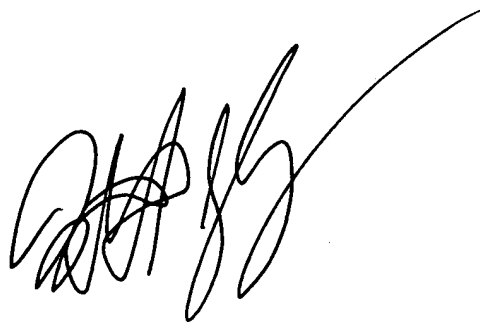information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Todd Ingberg

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TI

**TODD INGBERG
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